

Remarks

These remarks will first review what Applicants are claiming and then show why neither Whatley, Carey, nor Dar discloses what is being claimed.

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What Applicant is claiming

Applicants' claim 5 is exemplary for what Applicant is claiming. The claim broadly sets forth Applicants' invention as a "method employed in a distributed database system . . . for responding to a request":

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- 1 5. A method employed in a distributed database system that includes a plurality
- 2 of database systems for responding to a request received in a database system of
- 3 the plurality,
- 4 the method comprising the steps performed during execution of the request in the
- 5 database system of:
- 6 determining that the request is preferably executed at least in part in
- 7 another database system of the plurality; and
- 8 redirecting the execution of at least the part of the request to the other
- 9 database system.

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Beginning with definitions of important terms, as may be seen from Applicants' FIG. 1, the "distributed database system" includes "a plurality of database systems". It is clear from the discussion beginning at page 3, line 1 that a "database system" is a system that can respond to requests that include queries written in a query language such as SQL. It is also clear from FIG.

- 15 1 and the discussion beginning at page 12, line 8, that each of the database systems in the distributed database system of claim 5 is a full-fledged database system, i.e., it has all of the machinery necessary to define database objects and to execute queries that specify the objects. It is further important to claim 5 that the steps of the method are performed "during execution of the request in a database system of the plurality" and that the method steps involve "another
- 20 database system of the plurality", that is, another database system belonging to the distributed database system.

Traversal of the rejections based on Whatley

- 25 What Whatley discloses

Whatley's system is best shown in FIG. 1, discussed beginning at col. 2, line 57. The parts of the system that are relevant to the present context include an IBM DB2 database system 24 and a cache 32. DB2 database system 24 is a standard SQL database system. Cache 32 contains stored SQL queries and for each stored query, the result set returned by the query from DB2 system 24. How cache 32 is used in Whatley's system may be seen from the flowchart of FIG. 2, described beginning at col. 4, line 24. For each query provided by a user to DB 24, Whatley's system compares the query with the stored queries in cache 32 (116). If an identical query is found and if time stamps indicate that the result set returned by the query is still valid (122), the result set is retrieved from cache 32 and the query is not run on DB 24 (124); otherwise, it is run on DB 24 and the new result set is stored in cache 32. If an identical query is not found and it is a kind that is to be cached (118), the query is run on DB 24 and both the query and the result set are stored in cache 32 (120).

Why Whatley does not anticipate Applicants' claims

- It will be immediately apparent from the foregoing that Whatley does not disclose a "distributed database system". Cache 32, which contains only copies of queries and their associated result sets cannot possibly be termed a "database system" and consequently, Whatley does not disclose the distributed database system required by the claim. That has a number of consequences when one tries to read Whatley's disclosure onto Applicants' claim:
- Applicants' claim requires that the method steps be "performed during execution of the request in the database system", not in a cache that is not a database system.
 - Whatley discloses nothing corresponding to the claim's "other database system" and since that is the case, the method steps of the claim, which both require such an "other database system" cannot be performed in Whatley's system.
- For the above reasons, Whatley cannot anticipate Applicants' claim 5. As Examiner will immediately see, the above reasoning applies equally to Applicants' other independent claim 15 and to the dependent Beauregard claims 10 and 20.

As for the other dependent claims, they are of course patentable over Whatley because they are dependent from patentable claims, but they are also patentable in their own rights over the reference. The arguments made in the following with regard to claims 6-9 apply equally to claims 16-19 and to the dependent Beauregard claims 11-14 and 21-24.

Claim 6: This claim requires that “an object required for execution of the request is lacking in the database system”. As pointed out above, Whatley’s cache 32 is not a “database system”.

5 *Claim 7:* The additional steps of claim 7 are, according to claim 5, performed “in the database system”, and as pointed out above, there is no disclosure whatever of what happens inside DB2 24, and thus no disclosure of “modifying the form” or of “[redirecting] the modified form.”

Claim 8: There is of course also no disclosure of cursors in Whatley, and thus no disclosure of the claimed marking of the cursor.

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Claim 9: There is also no disclosure of requests that contain calls to procedure objects in Whatley, and thus none of rewriting calls as remote procedure calls.

Traversal of the rejection based on Carey

15 What Carey discloses

Carey’s FIG. 1 is described as follows at col. 7, lines 34-38:

20 The business object server 110 comprises a query service 112 for handling queries from the client application 108 and an object cache 114 for storing a portion of data retrieved from the RDBMS 116. The data in the object cache 114 can be modified directly in the object cache 114.

The purpose of this arrangement is to permit client application 108 to use a query to retrieve data from RDBMS 116 and then to deal with the retrieved data as objects (col. 7, lines 39-48). As set forth at col. 6, lines 29-33, the difference between queries over relational databases and
25 queries over object databases is the following:

 In contrast with queries over relational databases, which return values that correspond to attributes in the rows of tables, queries over object-oriented databases can return handles to application objects as query results.

30 A problem with the system of FIG. 1 is that client application program 108 may update objects both in object cache 114 and the data in RDBMS 116 that corresponds to the cached objects may be updated. The most recent data may thus be in either object cache 114 or RDBMS 116. To ensure that client application 108 gets the most current data and that the objects in object cache 114 and the corresponding data in RDBMS 116 are consistent with each other, Carey’s

system performs object-oriented queries on objects in object cache 114 as set forth in FIG. 3 and described as follows at col. 22, lines 13-25:

FIG. 3 is a flow diagram illustrating the basic steps performed by the DECAF optimization. In Block 300, the DECAF optimization transforms or performs an equivalent operation an object-oriented query into subqueries or their equivalent. At least one subquery is directed against a database, and one subquery is directed against an object cache. In Block 302, the DECAF optimization executes each subquery directed against the database to retrieve data from the database into the object cache. In Block 304, the DECAF optimization executes the subquery that is directed against the object cache to retrieve data for the query. The data that is retrieved incorporates updates to the object cache and the database.

Why Carey does not anticipate Applicants' claims

Like Whatley, Carey does not disclose the "distributed database system" of Applicants' claims.

The only database system disclosed in Carey is RDBMS 116; object cache 114 is exactly that: a cache of objects from RDBMS 116 which are fetchable from cache 114 by their object handles. Because Carey has no distributed database system, it also does not have the "database system" and "other database system" required by Applicants' claims. Further, as far as can be determined from Carey's disclosure, Carey never first attempts to fetch an object from object cache 114 and if the object is not there, then fetches the object from RDBMS 116. The problem addressed by Carey is not dealing with misses in the object cache, but rather ensuring consistency between object cache 114 and RDBMS 116; consequently, as shown in FIG. 3, Carey's system *always* executes two subqueries in response to an object-oriented query, one on the relational database and the other on the object cache to ensure that the user of Carey's system has the most recent data from both RDBMS 116 and object cache 114. Since that is the case, Carey's system does not perform claim 5's steps of

determining that the request is preferably executed at least in part in another database system of the plurality; and
redirecting the execution of at least the part of the request to the other database system.

For all of the above reasons, Cary cannot anticipate Applicants' claim 5. As Examiner will immediately see, the above reasoning applies equally to Applicants' other independent claim 15 and to the dependent Beauregard claims 10 and 20.

As for the other dependent claims, they are of course patentable over Carey because they are dependent from patentable claims, but they are also patentable in their own rights over the

reference. The arguments made in the following with regard to claims 6-9 apply equally to claims 16-19 and to the dependent Beauregard claims 11-14 and 21-24.

5 *Claim 6:* This claim requires that “an object required for execution of the request is lacking in the database system”. As pointed out above, Carey’s object cache 114 is not a “database system”.

10 *Claim 7:* The additional steps of claim 7 are, according to claim 5, performed “in the database system”, and there is no disclosure whatever of what happens inside RDBMS 116, and thus no disclosure of “modifying the form” or of “[redirecting] the modified form.”

Claim 8: There is of course also no disclosure of cursors in Carey, and thus no disclosure of the claimed marking of the cursor.

15 *Claim 9:* There is also no disclosure of requests that contain calls to procedure objects in Carey, and thus none of rewriting calls as remote procedure calls.

Patentability of Applicants’ claims over Dar

What Dar discloses

20 An IDS with the Dar reference accompanies this application. The Dar reference was cited in Carey’s *Description of related art* at col. 3, lines 23-26. As indicated by its title, what Dar discloses is a technique which Dar terms “semantic caching”. An overview of semantic caching is given in Section 3, which begins at the bottom of the first column of page 333. Semantic caching is related to Whatley’s technique of saving the results of a query on a database in a server in cache 32 and associating the results with the query. In semantic caching, the results of a query are saved in a cache and are associated with a *constraint formula* that describes the results. When another query, the *probe query*, is performed on the tables from which the saved results were returned, the constraint formula associated with the results is used with the probe query to produce a *remainder query* that specifies the parts of the results of the probe query that are not in the cache, and this remainder query is used to fetch the results that are not in the cache from the database in the server.

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Why Applicants’ claims are patentable over Dar

As just pointed out, what Dar discloses is an improved version of Whatley's technique in which cached query results are associated with a constraint formula that describes them. The association of the constraint formula with the cached query results permits easy production of a remainder query for the parts of the results of the probe query that were not specified in the
5 constraint formula and therefore are not in the cache. The remainder query is then used to fetch the additional results from the database in the server. The arguments made with regard to Whatley apply equally here: the cache cannot be reasonably termed a database system, and consequently, Dar does not disclose the distributed database system required by the claim. That has a number of consequences when one tries to read Dar's system onto Applicants' claim:

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- Applicants' claim requires that the method steps be "performed during execution of the request in the database system", not in a cache that is not a database system.
 - Dar discloses nothing corresponding to the claim's "other database system" and since that is the case, the method steps of the claim, which both require such an "other database system" cannot be performed in Dar's system.

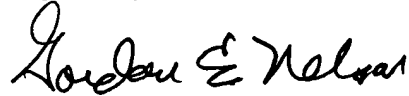
15 Additionally, Dar's system does not "redirect at least the part of the request" that is, the probe query, to the database system in the server; instead it produces a new query, the remainder query, and applies that to the database system in the server. As with Whatley, the above arguments also apply to the other independent claims and arguments similar to those made with regard to Whatley can be made with regard to the dependent claims.

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Conclusion

Applicants have replaced their *Abstract* with a shortened *Abstract*. Applicants have further shown that the claims presently in the application are patentable over the references cited by Examiner. Having replaced their *Abstract* and traversed Examiner's rejections and further showed why Applicants' claims are patentable over the Dar reference, Applicants have fulfilled the requirements of 37 C.F.R. 1.111(b) and respectfully request that that Examiner allow the claims. No additional fees are believed to be required for this amendment. Should any be, please charge them to deposit account number 501315.

Respectfully submitted,



Attorney of record,
Gordon E. Nelson
57 Central St., P.O. Box 782
Rowley, MA, 01969,
Registration number 30,093
Voice: (978) 948-7632
Fax: (866) 723-0359
9/13/04
Date

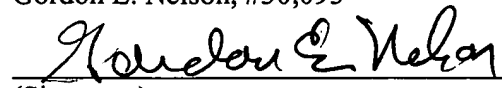
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Gordon E. Nelson, #30,093


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